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Modeling Long-term Behavior of Stock Market Prices Using Differential Equations XIAOXIANG YANG, CONAN ZHAO, IRINA MAZILU, Washington and Lee University — Due to incomplete information available in the market and uncertainties associated with the price determination process, the stock prices fluctuate randomly during a short period of time. In the long run, however, certain economic factors, such as the interest rate, the inflation rate, and the company's revenue growth rate, will cause a gradual shift in the stock price. Thus, in this paper, a differential equation model has been constructed in order to study the effects of these factors on the stock prices. The model obtained accurately describes the general trends in the AAPL and XOM stock price changes over the last ten years.

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